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Canadian Forestry Service-Maritimes
TECHNICAL NOTE

SIROCOCCUS SHOOT BLIGHT - A SERIOUS THREAT TO RED PINE IN THE MARITIMES

Shoot blight of conifers, caused by Sirococcus conigenus (DC) P. Cannon and Minter, has been known in North America since the early part of the century. In the 1960s it caused severe damage to red pine in the Lake States and was reported on several softwood hosts on the west coast. It was first found in the Maritimes in the early 1970s.

Continuing reports of serious damage to red pine by this disease instigated a special survey to evaluate its impact and distribution. The major natural stands of red pine and many of the plantations were located and inspected. All of these stands have been evaluated for disease intensity since autumn 1985. Intensity was estimated on a scale 0 to 100 (0 = no disease, 100 = all trees killed), based on 20 randomly selected trees each rated on a scale 0 to 5. Where disease was detected, samples of shoot blight were collected and cultured to identify the fungus.

The Present Situation

The disease is present in most of the larger natural stands (Figure 1). In many of these stands, understory regeneration is so heavily infected that restocking to red pine is unlikely.

Severely diseased plantations, also reported by the Forest Insect and Disease Survey, are now present in Yarmouth and Cumberland counties, Nova Scotia and in Kings County, Prince Edward Island (Figure 1). At Rushy Lake, near Quinan in Yarmouth County, several of the older plantations have already been killed and the disease is becoming well established in the younger plantations. In the Chignecto Game Sanctuary in Cumberland County, most of the older plantations are so severely blighted that further infection in 1987 could cause significant tree mortality.

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Development of the Disease

Older plantations are more likely to have shoot blight than young plantations (Figure 2) and the likelihood of shoot blight in young plantations increases with proximity to older red pine (Table 1). This can be expected because spores of Sirococcus are thought to be borne short distances by splashing rain. Long distance spread is possible on infected nursery stock. The disease appears to intensify over time within the most of our plantations and the major initial infection sources appear to be nearby older stands of red pine. Plantation size could also be important, the smaller the area, the less chance of disease buildup. It is interesting to note that shoot blight has seldom been observed in small (less than a dozen trees) plantings such as those associated with private dwellings.

Peak spore discharge occurs in the spring and infection takes place in the current year's shoots during the period of active growth, according to investigations in the Lake States. Research at the Canadian Forestry Service - Maritimes on a similar disease of black spruce seedlings indicated that cool, moist summers favored disease establishment and buildup. Since the disease on red pine is causing damage mainly in areas with cool, moist summers, there is hope that climate will limit its intensification in other parts of the region. However, enough anomalies exist to temper any expectations of a climatic limitation. Research on the effects of temperature and dew period is necessary and will commence during the next few months.

Can Red Pine be Grown in the Maritimes?

Yes, it can probably be planted in all but some coastal areas, if appropriate precautions are observed, i.e.,

1) new plantations should be located as far as possible from natural stands or older plantations of red pine,
2) plantations should be inspected frequently and blighted shoots destroyed,
3) dense plantations may benefit from spacing and lower branch pruning but this operation should not be carried out during the period of shoot growth when any activity in the stand could spread spores of the fungus (this is somewhat analogous to not picking peas during wet weather), and
4) the disease must be rigorously controlled in the nurseries through sanitation and spraying. Potential sources of infection in the nursery are seeds and cones from seed extraction plants and older softwood trees around the nursery. Chlorothalonil or maneb sprays may be used to protect nursery stock.

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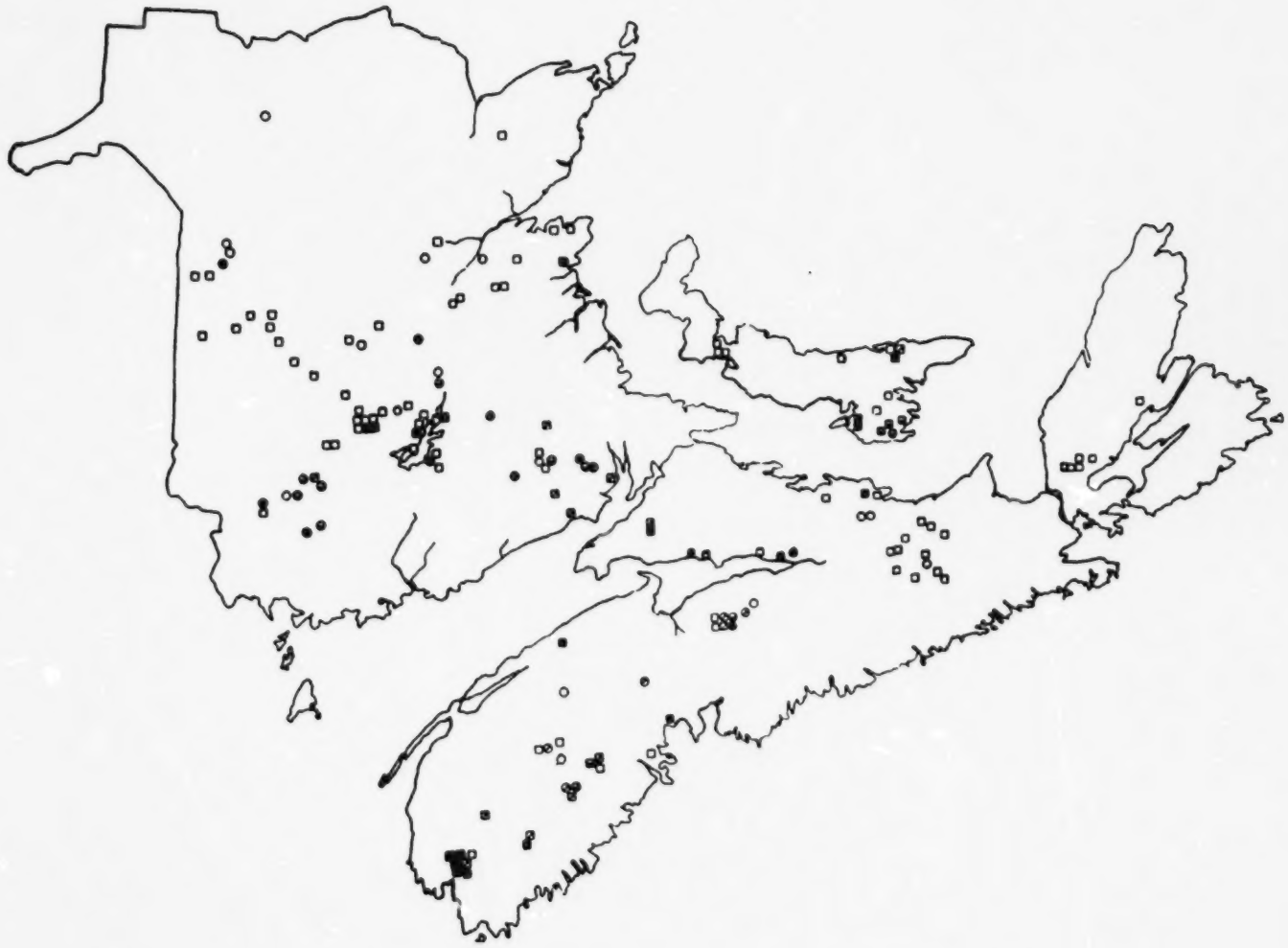

Figure 1. Locations of red pine stands in the Maritime Provinces inspected for shoot blight [○ - natural stands, □ - plantations with no evidence of disease; ⊘ ⊠ - stands or plantations with traces of shoot blight; ◒ ◧ - stands or plantations with visible but low incidence (10-20); ● ■ - with severe shoot blight (>20)].

Table 1. Proportion of young plantations (less than 10 m in height) with shoot blight, in relation to distance from older red pine.

Distance from older red pine	Number of plantations	Percent with shoot blight
Less than 1 km	25	48.0
More than 1 km	46	8.7

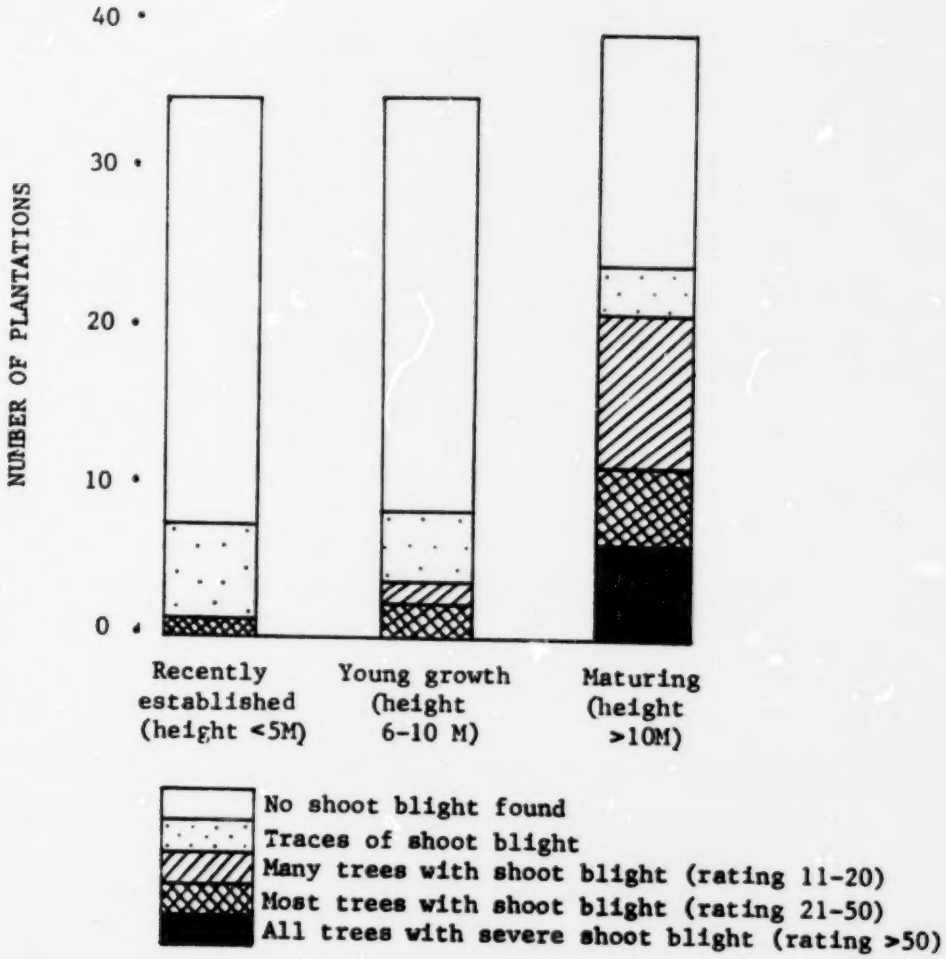

Figure 2: Incidence and severity of shoot blight in red pine plantations of different age/height classes.